

PATENT COOPERATION TREATY

RECEIVED

25 JAN 2005

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:	FRANKS, Barry et al.	FORMALITIES:	HSL / RP
	AMERSHAM PLC	PAT. OFF:	BF
	Amersham Place	ON DB:	—
	Little Chalfont		
	Buckinghamshire HP7 9NA		
	GRANDE BRETAGNE	CASE NO:	PU02118-PCT

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing
(day/month/year) 21.01.2005

Applicant's or agent's file reference PU02118-PCT	IMPORTANT NOTIFICATION	
International application No. PCT/EP 03/14946	International filing date (day/month/year) 29.12.2003	Priority date (day/month/year) 30.12.2002
Applicant AMERSHAM BIOSCIENCES AB et al.		

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCTMB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed invention is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Witzig, A Tel. +49 89 2399-5937	
--	--	---

PATENT COOPERATION TREATY
PCT
INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PU02118-PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP 03/14946	International filing date (day/month/year) 29.12.2003	Priority date (day/month/year) 30.12.2002
International Patent Classification (IPC) or both national classification and IPC G01N30/60		
Applicant AMERSHAM BIOSCIENCES AB et al.		

<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 1 sheets.</p>
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> I <input checked="" type="checkbox"/> Basis of the opinion II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application

Date of submission of the demand 02.07.2004	Date of completion of this report 21.01.2005
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Müller, T Telephone No. +49 89 2399-2285



INTERNATIONAL PRELIMINARY
EXAMINATION REPORT

International application No. PCT/EP 03/14946

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-5 as originally filed

Claims, Numbers

1-5 received on 10.01.2005 with letter of 10.01.2005

Drawings, Sheets

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description, pages:
- the claims, Nos.:
- the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP 03/14946

5. This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-5
	No: Claims	
Inventive step (IS)	Yes: Claims	1-5
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-5
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP 03/14946

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

- D1: US-A-5 169 522 (SHALON TADMOR ET AL) 8 December 1992 (1992-12-08)
- D2: US-A-3 747 479 (NIGHTINGALE D ET AL) 24 July 1973 (1973-07-24)
- D3: US-A-4 804 290 (BALSELLS PETER J) 14 February 1989 (1989-02-14)

Novelty

The document D1 is regarded as being the closest prior art to the subject-matter of claim 1 and shows (the references in parentheses applying to this document):

A column slurry packing compressor, comprising piston (200) and L shaped scraper (370) for a chromatography column (100), the piston (200) having first and second end faces (336, 338), first and second annular grooves (340, 350) with an O-ring (342) therein and a through hole (see figure 1 and the corresponding description).

The subject-matter of claim 1 differs from this known piston and scraper assembly in the characterising features of claim 1.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

Inventive step

The problem to be solved by the present invention may be regarded as ensuring a tight fit of the scraper in the chromatography column and to prevent liquids in the column from coming into contact with the sealing O-rings.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT). Documents D2 and D3 of the search report disclose the problem of sealing a piston and the structural features of the characterising portion of claim 1: D2 discloses a piston member comprising an L-shaped PTFE sheath (71) that is a scraper. The internal surface of the sheath is provided with an annular groove (78), and an O-ring (74), see figure 7 and the corresponding description on column 7, line 58 - column 8, line 33. Similarly, D3 discloses a cylindrical core (100), that is a piston with first and second circumfencial grooves (104,106) with a seal member (82)

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP 03/14946

having first and second grooves for accommodating a first and a second spring (94,96) that is biasing means. However, D2 and D3 are related to a piston for syringes and stopcocks and to a latching and sealing device in a syringe or plunger pump respectively. No hint is given in D1, which relates to a chromatography column, to look at piston and scraper assemblies per se, as disclosed in D2 and D3, or to combine the features of these documents with the teaching of D1.

Dependent claims:

Claims 2-5 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Claims

1. Piston and scraper assembly (26, 26') for a chromatography column, comprising a piston (5) and a scraper (25) wherein said piston (5) has a front, first face (7) a cylindrical portion (17), and a second, rear face (15), and a through hole (11) connecting said first face (7) to said second face (15), and is provided with an annular groove (23, 23') of depth D1 mm in the cylindrical portion (17), and wherein the scraper (25) is a ring, adapted to fit onto piston (5), with an L-shaped cross-section and having a complementary groove (39) of depth D2 mm in an inner face (37), characterised in that said annular groove (23, 23') is provided with a resilient sealing, locking and biasing means (45) which extends from said annular groove (23, 23') into said complementary groove (39) in order to retain said scraper (25) on said piston (5).
2. Piston and scraper assembly in accordance with claim 1 characterised in that said piston is provided with a further annular groove (21) containing a sealing means (43).
- 15 3. Piston and scraper assembly in accordance with any of the previous claims characterised in that said resilient sealing, locking and biasing means (45) is a sealing-ring with a thickness which is greater than $D1 + D2$ mm.
4. Piston and scraper assembly in accordance with any of claims 2-3 characterised in that said further annular groove (21) is closer than said annular groove (23, 23') to the first, front face of piston (5).
- 20 5. Piston and scraper assembly in accordance with any of the previous claims characterised in that said scraper is made of a polymer material.